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Impact of Financial System's Development on Economic Development: An Empirical Investigation

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***Abstract*—**Comparisons of financial development across countries are central to answering many of the questions on factors leading to economic development. For this reason this study analyzes the implications of financial system's development on country's economic development. The aim of the article: to analyze the impact of financial system's development on economic development. The following research methods were used: systemic, logical and comparative analysis of scientific literature, analysis of statistical data, time series model (Autoregressive Distributed Lag (ARDL) Model). The empirical results suggest about positive short and long term effect of stock market development on GDP per capita.

***Keywords*—**Banking sector, economic development, financial system's development, stock market, private bond market.

I. Introduction

WHEREAS financial system performs the essential economic function of channeling funds from lenders to borrowers, analysis of relationship between the evolution of financial system and the development of real economy is relevant. Most of scientists [1]-[16] focus on the analysis of the relation between financial development and economic growth, however, the number of scientific publications analyzing the relationship between financial system's development and economic development is quite limited. This empirical study focuses on the large heterogeneous sample of countries from different world regions. Comprehensive analysis of impact of financial system's development on economic development is the main scientific novelty of this article. The aim of the article is to analyze the impact of financial system's development on economic development. The research object is relationship between financial system's development and economic development. The research methods are systemic, logical and comparative analysis of scientific literature, analysis of statistical data, time series model (Autoregressive Distributed Lag (ARDL) Model).

II. Review of Studies Analyzing Relationship between Financial System's Development and Economic Development

There are many empirical studies that examine the relationship between financial development and economic growth. According to [13], this literature can be divided into two branches: first strand of this literature examines the impact of stock market developments on economic growth and the second strand focuses on the relationship between banking sector developments and economic growth. The results of these empirical studies [1]-[16] suggest that the link between financial development and economic growth is positive and strongly significant only at relatively high level of economic development; however, for relatively less developed economies, the relationship is much weaker, if not insignificant or even negative. The results of studies also indicate that there is no clear consensus on the direction of causality between financial development and economic growth and the empirical findings are country specific.

The analysis of scientific literature revealed that the relationship between financial system's development and economic development was analyzed only in a few studies. Reference [17] investigated the causality between financial development and real GDP. The evidence presented in this paper provides very little support to the view that finance is a leading sector in the process of economic development. On the other hand, authors found evidence that in quite a few countries economic growth systematically causes financial development. Reference [18] analyzed the importance of financial development for economic development. The results of this study suggest that financial intermediation is important for economic development and world output could increase by 53 percent if all countries adopted the best financial practice in the world. Reference [19] analyzed the relation between financial and economic development in the European Union (EU) countries. The results of this study suggest about a positive statistically significant monotonic relationship between economic and financial development in the EU countries, however, the results in different EU countries clusters are mixed and there is no clear consensus on the relation between financial and economic development. The results of the aforementioned empirical studies suggest that financial development is important for economic development; however, the impact of financial development on economic development is country specific.

III. Impact of Financial System's Development on Economic Development: Research Methodology

While the evolution of financial system is essential for country's economic development, the impact of financial system's development on economic development is analyzed in this empirical study.

A. Research Methodology

In order to estimate the short-run and long-run effect of financial system's development on economic development the

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autoregressive distributed lag (ARDL) models (1-3) were applied to the data. ARDL models are used to estimate the long-term equilibrium relationships between variables and long and short term effects of independent variables on the dependent variable. ARDL models has several advantages. The coefficients can be estimated by Ordinary Least Squares (OLS) or Generalized Least Squares (GLS), assuming that independent variables are strictly exogenous. Interpretation of the δ_n coefficients is also straightforward. However, there are two disadvantages to the ARDL models. High levels of correlation among the regressors imply multicollinearity, which leads to unreliable coefficient estimates with large variances and standard errors. The second disadvantage is the specification the length of the lag of independent variables, especially in small samples.

$$\Delta \ln GDPPC_{i,t} = \alpha + \beta_0 \Delta lnGDPPC_{i,t-1} + \sum_{n=0}^{5} \delta_n \Delta \ln PCDMB_{i,t-n} + \varepsilon_t \quad (1)$$

$$\Delta \ln GDPPC_{i,t} = \alpha + \beta_0 \Delta lnGDPPC_{i,t-1} + \sum_{n=0}^{5} \delta_n \Delta \ln SMC_{i,t-n} + \varepsilon_t \quad (2)$$

$$\Delta \ln GDPPC_{i,t} = \alpha + \beta_0 \Delta lnGDPPC_{i,t-1} + \sum_{n=0}^{5} \delta_n \Delta \ln PBMC_{i,t-n} + \varepsilon_t \quad (3)$$

The first differences of the logarithms of endogenous and exogenous variables (see Table I) were included in ARDL models with a suitable number of lags. The estimates of coefficients α, β_0, δ_n will be estimated using OLS method. Coefficient β_0 estimates the proportion of the deviation from equilibrium at *t-1* that is maintained at time *t* and $\beta_0 - 1$ tells us the speed of return to equilibrium of dependent variable. Coefficient δ_0 estimates the short-term effect of $\Delta \ln PCDMB$, $\Delta \ln SMC$, and $\Delta \ln PBMC$ on $\Delta \ln GDPPC$ and sum of δ_n estimates – the long-term effect of a unit change of independent variables on $\Delta \ln GDPPC$. Application of ARDL models for panel data has some limitations. References [20], [21] pointed out the heterogeneity of coefficients across countries and showed that panel estimates often do not correspond to country-specific estimates. Consequently, generalizations based on panel results may proffer incorrect inferences for several countries of the panel and panel estimates may be misleading at country level. For this reason ARDL models (1-3) will be applied for cross-country data. The simultaneous impact of different components of the financial system (financial markets and banks) on economic development was not investigated due the data limitation.

B. Data

Empirical research focuses on the annual data for 22 countries (Argentina (ARG), Australia (AUS), Brazil (BRA), China (CHN), Colombia (COL), Finland (FIN), Greece (GRC), Hong Kong (HKG), India (IND), Italy (ITA), Japan (JPN), Korea (KOR), Malaysia (MYS), Mexico (MEX), Portugal (PRT), Singapore (SGP), South Africa (ZAF), Spain (ESP), Switzerland (CHE), Thailand (THA), United Kingdom (GBR), United States (USA)) and covers the period from 1990 to 2011. The data sample selection was based on availability of statistical data.

IV. Impact of Financial System's Development on Economic Development: Research Results

The analysis of main financial system's development indicators revealed that in most high developed countries all components of the financial system (banks and financial markets) are well-developed, e.g. United States, Switzerland, Australia, United Kingdom, and Japan (see Table II). However, there are some exceptions, e.g. Singapore and Hong Kong where only stock market's development level is very high. So, high development level of country's economy does not imply high level of financial system's development, and vice versa.

TABLE I
VARIABLES USED IN RESEARCH ON IMPACT OF FINANCIAL SYSTEM'S DEVELOPMENT ON ECONOMIC DEVELOPMENT

Variable	Variable description	Data source
PCDMB	Private credit by deposit money banks and other financial institutions to GDP (%)	[22]
SMC	Stock market capitalization to GDP (%)	[22]
PBMC	Private bond market capitalization to GDP (%)	[22]
GDPPC	Gross domestic product based on purchasing-power-parity (PPP) per capita GDP (PPP dollars per person)	[23]

TABLE II
THE MAIN FINANCIAL SYSTEM'S DEVELOPMENT INDICATORS IN 2011 [22]

Country	PCDMB	Country	SMC	Country	PBMC
ESP	207.84	HKG	396.88	USA	91.86
PRT	193.55	CHE	179.48	PRT	69.46
GBR	191.54	ZAF	145.23	KOR	59.25
USA	187.70	SGP	145.19	MYS	58.09
HKG	186.24	MYS	144.09	ESP	54.45
JPN	177.65	GBR	126.53	AUS	49.26
CHE	167.05	USA	110.16	ITA	37.79
ZAF	141.52	AUS	103.39	JPN	37.19
THA	130.87	KOR	96.24	GRC	34.09
AUS	129.24	THA	81.69	CHE	29.49
GRC	123.56	ESP	76.48	CHN	23.08
ITA	121.76	IND	68.67	BRA	21.68
CHN	121.49	JPN	68.58	FIN	21.43
SGP	106.91	COL	62.82	ZAF	18.77
MYS	106.40	CHN	58.74	MEX	15.68
KOR	98.43	BRA	58.33	HKG	15.28
FIN	93.85	FIN	50.95	THA	12.73
BRA	63.45	MEX	37.44	GBR	12.32
IND	47.15	PRT	31.50	SGP	10.01
COL	42.00	GRC	18.99	IND	4.89
MEX	24.03	ITA	17.50	ARG	1.97
ARG	13.96	ARG	11.82	COL	0.57

Testing for unit root behavior in the first differences of the logarithms of variables, the Augmented Dickey-Fuller (ADF) test was implemented. All time series appear stationary in their first differences. The banking sector development variable is assumed exogenous and the parameter estimates of ARDL models are reported in Table III.

TABLE III
PARAMETER ESTIMATES OF THE ARDL MODELS (P-VALUES IN PARENTHESIS) AND THE SHORT AND LONG TERM EFFECT OF BANKING SECTOR DEVELOPMENT ($\Delta \ln PCDMB$) ON ECONOMIC DEVELOPMENT (GDP PER CAPITA ($\Delta \ln GDPPC$))

	ARG	AUS	BRA	CHE	CHN	COL	ESP	FIN	GBR	GRC	HKG	IND	ITA	JPN	KOR	MEX	MYS	PRT	SGP	THA	USA	ZAF
α	0.07	0.07	0.05	0.03	0.20	0.02	0.04	0.04	0.04	0.00	0.05	0.05	0.02	0.02	0.03	0.03	0.02	0.00	0.05	0.04	0.02	0.04
	(0.19)	(0.01)	(0.00)	(0.02)	(0.00)	(0.40)	(0.11)	(0.05)	(0.18)	(0.86)	(0.05)	(0.07)	(0.39)	(0.14)	(0.50)	(0.06)	(0.22)	(0.95)	(0.03)	(0.10)	(0.17)	(0.01)
β_0	-0.42	0.11	-0.66	0.11	-0.60	0.54	0.25	0.48	0.38	0.94	0.18	0.29	0.25	0.19	0.46	0.07	0.42	-0.27	0.00	0.07	0.28	0.28
	(0.66)	(0.78)	(0.08)	(0.71)	(0.12)	(0.41)	(0.60)	(0.16)	(0.51)	(0.01)	(0.63)	(0.46)	(0.49)	(0.59)	(0.54)	(0.85)	(0.20)	(0.59)	(0.99)	(0.84)	(0.47)	(0.28)
δ_0	0.40	-0.10	0.22	-0.56	-0.46	-0.09	0.04	-0.91	0.10	-0.01	-0.39	-0.18	-0.12	-0.59	-0.66	-0.06	-0.42	0.45	-0.52	-0.02	0.37	-0.06
	(0.43)	(0.45)	(0.06)	(0.09)	(0.00)	(0.58)	(0.88)	(0.03)	(0.80)	(0.97)	(0.07)	(0.47)	(0.80)	(0.02)	(0.19)	(0.59)	(0.04)	(0.11)	(0.00)	(0.93)	(0.20)	(0.67)
δ_1	-0.45	0.01	0.06	0.79	-0.06	0.05	-0.11	0.26	-0.80	0.15	-0.17	0.12	0.18	0.47	0.30	-0.01	0.12	0.02	-0.10	-0.37	-0.06	0.19
	(0.31)	(0.93)	(0.58)	(0.02)	(0.65)	(0.64)	(0.68)	(0.38)	(0.16)	(0.41)	(0.53)	(0.53)	(0.79)	(0.19)	(0.57)	(0.90)	(0.50)	(0.92)	(0.66)	(0.31)	(0.87)	(0.22)
δ_2	0.13	-0.42	0.00	0.02	-0.21	0.02	0.13	0.03	0.92	-0.01	0.29	-0.04	-0.08	-0.04	0.25	-0.05	0.04	-0.07	0.12	0.29	-0.16	-0.36
	(0.65)	(0.02)	(0.97)	(0.94)	(0.06)	(0.83)	(0.62)	(0.91)	(0.22)	(0.97)	(0.21)	(0.83)	(0.91)	(0.91)	(0.36)	(0.62)	(0.80)	(0.71)	(0.34)	(0.48)	(0.58)	(0.04)
δ_3	-0.18	-0.10	-0.13	-0.35	-0.16	-0.05	-0.16	0.26	-1.26	-0.15	-0.23	-0.09	-0.19	-0.31	-0.04	0.06	-0.20	-0.15	0.03	-0.12	-0.18	-0.08
	(0.52)	(0.57)	(0.28)	(0.26)	(0.34)	(0.61)	(0.55)	(0.43)	(0.13)	(0.48)	(0.29)	(0.61)	(0.75)	(0.42)	(0.88)	(0.56)	(0.24)	(0.42)	(0.79)	(0.77)	(0.54)	(0.39)
δ_4	0.02	0.01	0.09	-0.23	0.06	-0.04	-0.21	0.05	0.65	0.04	-0.08	0.18	0.10	-0.22	-0.11	-0.07	0.23	0.10	-0.05	-0.26	0.20	0.01
	(0.93)	(0.92)	(0.29)	(0.49)	(0.58)	(0.69)	(0.42)	(0.87)	(0.32)	(0.84)	(0.68)	(0.41)	(0.84)	(0.59)	(0.73)	(0.38)	(0.11)	(0.60)	(0.71)	(0.51)	(0.52)	(0.92)
δ_5	-0.12	-0.24	-0.05	-0.60	-0.11	-0.05	0.05	-0.20	-0.22	-0.03	-0.29	0.19	-0.05	0.26	0.21	0.10	-0.18	0.25	-0.09	0.04	-0.08	-0.12
	(0.50)	(0.07)	(0.30)	(0.15)	(0.17)	(0.66)	(0.84)	(0.39)	(0.58)	(0.85)	(0.13)	(0.33)	(0.89)	(0.32)	(0.40)	(0.21)	(0.10)	(0.23)	(0.52)	(0.86)	(0.79)	(0.07)
$\sum_{n=0}^{5}\delta_n$		-0.66	0.22	0.23	-0.67			-0.91			-0.39			-0.59			-0.60		-0.52			-0.48
Adj. R^2	-0.23	0.73	0.25	0.45	0.87	-0.14	0.32	0.21	0.30	0.37	0.34	0.07	-0.58	0.29	0.00	-0.37	0.34	0.22	0.59	0.07	0.02	0.47
$\hat{\sigma}$	0.07	0.01	0.02	0.02	0.01	0.03	0.02	0.03	0.02	0.03	0.04	0.02	0.03	0.02	0.04	0.04	0.04	0.02	0.03	0.05	0.02	0.02
JB	1.28	1.02	1.71	0.23	0.90	0.40	5.57	3.00	0.66	0.46	0.35	0.79	26.62	0.99	0.64	3.93	2.97	2.62	1.13	1.46	2.54	8.83
	(0.53)	(0.60)	(0.42)	(0.89)	(0.64)	(0.82)	(0.06)	(0.22)	(0.72)	(0.80)	(0.84)	(0.68)	(0.00)	(0.61)	(0.72)	(0.14)	(0.23)	(0.27)	(0.57)	(0.48)	(0.28)	(0.01)
LM(2)	0.02	0.01	1.37	2.08	0.70	2.13	0.72	0.26	0.09	0.82	0.15	0.62	0.20	1.21	0.11	0.16	3.89	1.47	1.46	3.24	0.55	0.73
	(0.98)	(0.99)	(0.32)	(0.21)	(0.53)	(0.20)	(0.52)	(0.77)	(0.91)	(0.48)	(0.86)	(0.57)	(0.82)	(0.36)	(0.90)	(0.85)	(0.08)	(0.30)	(0.30)	(0.11)	(0.60)	(0.52)
BPG	1.24	1.12	0.62	1.23	1.40	0.56	0.47	0.99	2.87	1.12	3.90	0.62	0.33	1.69	4.89	0.49	2.61	0.65	1.98	0.95	1.48	0.31
	(0.38)	(0.43)	(0.73)	(0.38)	(0.32)	(0.77)	(0.83)	(0.50)	(0.08)	(0.43)	(0.04)	(0.73)	(0.92)	(0.24)	(0.02)	(0.81)	(0.10)	(0.71)	(0.18)	(0.52)	(0.30)	(0.93)

Adj. R^2 – adjusted coefficient of determination; $\hat{\sigma}$ – standard error of regression; JB – Jarque-Bera normality test; LM(2) – Breusch-Godfrey Lagrange Multiplier test for autocorrelation up to order 2; BPG – Breusch-Pagan-Godfrey test for heteroskedasticity.

The empirical results presented in Table III show that parameters β_0 and δ_n estimates are found to be statistically significant only in 11 countries. While the ARDL models are well representing short-run relationship in GDP per capita the best available estimates of the banking sector development elasticities are the δ_0 parameter estimates. Thus, the short-run banking sector development elasticities are relatively high and negative in most of countries (Switzerland, China, Finland, Hong Kong, Japan, Malaysia, and Singapore), except Brazil. These results indicate about negative short-run effect of banking sector development on economic development. The long-run cumulative effect of banking sector development on economic development at lag *t-5* is also negative in most of countries (Australia, China, Finland, Hong Kong, Japan, Malaysia, Singapore, and South Africa) with some exceptions (Brazil and Switzerland). The empirical results suggest about the negative short and long term effect of banking sector development on economic development. These results can be explained by the fact that in most of countries where negative short and long term effect was identified financial system is market-based.

The empirical results of stock market development effect on economic development of country are reported in Table IV. The short and long-run elasticities between the stock market and economic development are relative low and close to zero in most of countries. However, a positive short term effect of stock market development was identified in Australia, Spain, Finland, India, Malaysia and Singapore (except Argentina). The results of long-run effect of stock market development on GDP per capita are mixed. In most of countries (Australia, Brazil, Colombia, Spain, Finland, India, Korea, Malaysia, Portugal, Singapore and Thailand) a positive long-term effect of stock market development on GDP per capita was identified, however, this long-term effect is very weak. In some countries (Argentina, China, and United Kingdom) this effect was negative. A positive short and long term effect of stock market development on economic development can be explained by the fact that high stock market's development level is typical for countries where the whole financial system is well-functioning and all components of the financial system are well-developed.

The results of private bond market development effect on economic development of country are presented in Table V. The negative short term effect of private bond market development on economic development was identified in Argentina, Brazil, Finland, Italy and Korea and a positive effect only in India.

However, the results of the long run effect of private bond market development on economic development are mixed. A negative long term effect was identified in Argentina, Brazil, Finland, Italy, Thailand, while a positive effect – in India, Korea, Mexico, and Portugal. Thus, the empirical results suggest that in some countries private bond market development fosters economic development of country, however, in some countries this effect seems to be negative.

TABLE IV
PARAMETER ESTIMATES OF THE ARDL MODELS (P-VALUES IN PARENTHESIS) AND THE SHORT AND LONG TERM EFFECT OF STOCK MARKET DEVELOPMENT ($\Delta \ln SMC$) ON ECONOMIC DEVELOPMENT (GDP PER CAPITA ($\Delta \ln GDPPC$))

	ARG	AUS	BRA	CHE	CHN	COL	ESP	FIN	GBR	GRC	HKG	IND	ITA	JPN	KOR	MEX	MYS	PRT	SGP	THA	USA	ZAF
α	0.05	0.02	0.05	0.03	0.10	0.03	0.01	0.03	-0.01	0.00	0.07	0.05	0.02	0.03	0.07	0.04	0.04	0.02	0.07	0.07	0.01	0.03
	(0.02)	(0.02)	(0.03)	(0.11)	(0.00)	(0.03)	(0.32)	(0.10)	(0.64)	(0.95)	(0.02)	(0.12)	(0.16)	(0.03)	(0.03)	(0.03)	(0.15)	(0.11)	(0.01)	(0.03)	(0.54)	(0.04)
β_0	-0.25	0.05	-0.08	0.20	0.30	-0.05	0.47	0.13	1.01	0.80	0.25	0.29	0.23	-0.22	-0.28	-0.15	0.24	0.32	-0.20	-0.58	0.71	0.27
	(0.42)	(0.87)	(0.82)	(0.63)	(0.14)	(0.89)	(0.08)	(0.74)	(0.00)	(0.03)	(0.39)	(0.53)	(0.54)	(0.55)	(0.48)	(0.67)	(0.60)	(0.39)	(0.57)	(0.31)	(0.05)	(0.45)
δ_0	-0.13	0.05	0.04	0.05	0.01	0.03	0.10	0.08	0.04	0.03	-0.06	0.08	0.07	0.03	-0.04	0.03	0.13	0.02	0.13	0.03	0.09	0.05
	(0.01)	(0.03)	(0.31)	(0.31)	(0.66)	(0.60)	(0.01)	(0.08)	(0.47)	(0.26)	(0.59)	(0.03)	(0.15)	(0.67)	(0.31)	(0.64)	(0.04)	(0.48)	(0.07)	(0.52)	(0.12)	(0.27)
δ_1	0.01	0.08	0.07	0.05	-0.01	0.09	0.08	-0.01	0.13	0.00	0.02	-0.05	-0.01	0.05	0.12	0.08	0.14	0.09	0.12	0.13	0.03	0.09
	(0.92)	(0.01)	(0.10)	(0.44)	(0.46)	(0.10)	(0.09)	(0.86)	(0.07)	(0.89)	(0.89)	(0.44)	(0.95)	(0.49)	(0.01)	(0.25)	(0.10)	(0.05)	(0.15)	(0.08)	(0.71)	(0.15)
δ_2	-0.13	0.05	-0.03	-0.04	-0.04	0.06	-0.06	-0.01	-0.22	0.03	-0.27	0.08	-0.04	0.00	-0.06	-0.08	-0.05	-0.09	-0.01	0.05	-0.11	-0.05
	(0.04)	(0.09)	(0.21)	(0.53)	(0.11)	(0.29)	(0.14)	(0.85)	(0.02)	(0.59)	(0.14)	(0.15)	(0.64)	(0.98)	(0.28)	(0.30)	(0.59)	(0.15)	(0.94)	(0.36)	(0.27)	(0.34)
δ_3	0.00	0.04	0.01	0.00	-0.02	0.00	0.02	0.01	0.13	-0.02	-0.01	-0.07	0.11	-0.02	0.09	0.00	0.08	0.11	0.07	0.06	0.06	0.00
	(0.98)	(0.14)	(0.71)	(0.97)	(0.21)	(0.96)	(0.54)	(0.87)	(0.15)	(0.69)	(0.94)	(0.33)	(0.30)	(0.82)	(0.11)	(0.97)	(0.05)	(0.09)	(0.35)	(0.23)	(0.57)	(0.95)
δ_4	-0.03	0.03	-0.04	-0.04	-0.03	-0.08	-0.05	0.01	-0.02	0.04	-0.11	0.06	-0.11	-0.02	-0.06	-0.03	-0.01	-0.08	0.01	0.03	-0.02	-0.07
	(0.57)	(0.23)	(0.10)	(0.59)	(0.13)	(0.20)	(0.22)	(0.88)	(0.82)	(0.46)	(0.40)	(0.31)	(0.23)	(0.80)	(0.21)	(0.72)	(0.84)	(0.20)	(0.90)	(0.51)	(0.87)	(0.17)
δ_5	0.07	0.03	-0.03	-0.01	-0.02	0.01	0.07	-0.02	0.01	-0.02	-0.14	-0.02	0.05	-0.04	0.01	0.01	-0.01	0.02	-0.07	-0.05	0.02	0.01
	(0.09)	(0.35)	(0.27)	(0.90)	(0.09)	(0.73)	(0.05)	(0.73)	(0.90)	(0.67)	(0.19)	(0.61)	(0.35)	(0.54)	(0.72)	(0.83)	(0.81)	(0.56)	(0.29)	(0.26)	(0.79)	(0.81)
$\sum_{n=0}^{5}\delta_n$	-0.19	0.18	0.03		-0.02	0.09	0.25	0.08	-0.09			0.08			0.12		0.35	0.20	0.13	0.13		
Adj. R^2	0.55	0.70	0.43	0.18	0.82	0.36	0.78	0.10	0.61	0.44	0.22	0.23	0.29	-0.20	0.42	-0.19	0.65	0.67	0.31	0.51	0.55	0.40
$\hat{\sigma}$	0.04	0.01	0.02	0.02	0.01	0.03	0.01	0.04	0.02	0.03	0.04	0.02	0.02	0.03	0.03	0.04	0.03	0.01	0.04	0.04	0.01	0.02
JB	0.33	1.09	1.16	0.54	1.18	1.31	0.83	3.95	0.92	0.85	0.44	1.15	1.60	1.49	1.10	1.13	0.85	0.14	4.24	1.24	0.95	0.42
	(0.84)	(0.60)	(0.56)	(0.76)	(0.55)	(0.52)	(0.66)	(0.14)	(0.63)	(0.66)	(0.80)	(0.57)	(0.45)	(0.48)	(0.58)	(0.57)	(0.65)	(0.93)	(0.12)	(0.54)	(0.62)	(0.81)
LM(2)	4.76	0.22	0.89	0.37	0.54	2.02	2.50	0.69	0.02	0.60	0.89	0.16	3.68	0.15	0.50	0.23	0.98	0.88	0.24	0.30	1.43	2.42
	(0.06)	(0.81)	(0.46)	(0.71)	(0.61)	(0.21)	(0.16)	(0.54)	(0.98)	(0.58)	(0.46)	(0.86)	(0.09)	(0.87)	(0.63)	(0.80)	(0.43)	(0.46)	(0.79)	(0.75)	(0.31)	(0.17)
BPG	0.75	0.38	0.32	0.74	0.58	1.33	0.81	0.53	2.92	1.60	0.88	1.61	1.29	1.44	0.35	1.59	0.38	3.94	0.81	0.66	0.88	0.83
	(0.64)	(0.89)	(0.93)	(0.65)	(0.76)	(0.35)	(0.60)	(0.79)	(0.08)	(0.26)	(0.56)	(0.26)	(0.36)	(0.31)	(0.91)	(0.26)	(0.89)	(0.04)	(0.61)	(0.70)	(0.56)	(0.59)

Adj. R^2 – adjusted coefficient of determination; $\hat{\sigma}$ – standard error of regression; JB – Jarque-Bera normality test; LM(2) – Breusch-Godfrey Lagrange Multiplier test for autocorrelation up to order 2; BPG – Breusch-Pagan-Godfrey test for heteroskedasticity.

TABLE V
PARAMETER ESTIMATES OF THE ARDL MODELS (P-VALUES IN PARENTHESIS) AND THE SHORT AND LONG TERM EFFECT OF PRIVATE BOND MARKET DEVELOPMENT ($\Delta \ln PBMC$) ON ECONOMIC DEVELOPMENT (GDP PER CAPITA ($\Delta \ln GDPPC$))

	ARG	AUS	BRA	CHE	CHN	COL	ESP	FIN	GBR	GRC	HKG	IND	ITA	JPN	KOR	MEX	MYS	PRT	SGP	THA	USA	ZAF
α	0.02	0.01	0.05	0.03	0.04	0.02	0.02	0.02	0.01	0.00	0.07	0.07	0.02	0.03	0.02	0.03	0.07	0.01	0.06	0.01	0.01	0.03
	(0.35)	(0.32)	(0.01)	(0.13)	(0.25)	(0.37)	(0.07)	(0.34)	(0.38)	(0.83)	(0.02)	(0.01)	(0.07)	(0.05)	(0.34)	(0.12)	(0.04)	(0.69)	(0.02)	(0.80)	(0.87)	(0.12)
β_0	0.41	0.49	-0.04	-0.08	0.71	0.58	0.44	0.48	0.57	0.82	-0.08	-0.13	0.24	-0.16	0.50	-0.18	-0.14	0.72	-0.26	0.48	0.59	0.29
	(0.24)	(0.15)	(0.89)	(0.85)	(0.01)	(0.22)	(0.12)	(0.19)	(0.11)	(0.01)	(0.78)	(0.72)	(0.48)	(0.65)	(0.19)	(0.53)	(0.72)	(0.05)	(0.48)	(0.25)	(0.34)	(0.42)
δ_0	-0.23	0.02	-0.13	-0.10	-0.14	-0.03	-0.05	-0.43	-0.03	0.00	-0.48	0.07	-0.31	-0.26	-0.11	-0.04	-0.06	-0.01	-0.13	-0.03	0.00	-0.05
	(0.02)	(0.47)	(0.10)	(0.45)	(0.12)	(0.61)	(0.44)	(0.08)	(0.88)	(0.99)	(0.12)	(0.08)	(0.01)	(0.22)	(0.07)	(0.50)	(0.65)	(0.92)	(0.40)	(0.86)	(1.00)	(0.54)
δ_1	0.22	0.03	0.15	-0.08	0.11	0.02	0.11	0.41	0.15	0.00	0.14	0.02	0.16	-0.11	0.25	0.14	0.12	0.02	-0.04	0.35	-0.20	0.09
	(0.07)	(0.53)	(0.05)	(0.51)	(0.21)	(0.72)	(0.21)	(0.13)	(0.48)	(0.96)	(0.71)	(0.68)	(0.27)	(0.67)	(0.01)	(0.05)	(0.31)	(0.84)	(0.85)	(0.05)	(0.57)	(0.39)
δ_2	-0.14	-0.01	-0.06	-0.15	-0.05	0.03	-0.09	-0.35	-0.21	-0.01	0.22	-0.03	-0.22	-0.03	-0.11	-0.05	-0.02	-0.14	0.11	-0.37	0.27	-0.04
	(0.17)	(0.79)	(0.07)	(0.28)	(0.58)	(0.49)	(0.34)	(0.11)	(0.20)	(0.61)	(0.57)	(0.46)	(0.05)	(0.92)	(0.14)	(0.37)	(0.87)	(0.17)	(0.57)	(0.04)	(0.50)	(0.75)
δ_3	0.10	0.04	0.01	0.14	-0.05	-0.03	0.02	0.11	0.15	0.01	-0.05	0.00	0.09	0.03	0.12	-0.01	-0.14	0.23	-0.09	0.13	-0.54	0.11
	(0.30)	(0.37)	(0.77)	(0.38)	(0.58)	(0.44)	(0.84)	(0.58)	(0.33)	(0.63)	(0.87)	(0.95)	(0.49)	(0.92)	(0.05)	(0.89)	(0.20)	(0.04)	(0.62)	(0.44)	(0.25)	(0.35)
δ_4	-0.01	0.02	-0.02	-0.04	0.01	-0.02	0.00	0.06	-0.03	-0.01	-0.10	0.02	0.03	0.00	-0.06	-0.08	-0.13	-0.13	0.10	-0.01	0.55	-0.02
	(0.93)	(0.57)	(0.26)	(0.77)	(0.90)	(0.73)	(0.99)	(0.74)	(0.84)	(0.64)	(0.67)	(0.56)	(0.77)	(0.99)	(0.32)	(0.23)	(0.28)	(0.16)	(0.60)	(0.96)	(0.26)	(0.88)
δ_5	0.01	0.02	-0.05	0.04	0.02	-0.02	-0.08	-0.08	0.07	-0.01	-0.03	-0.01	-0.01	0.14	0.01	0.07	0.00	0.03	0.18	0.25	0.19	0.00
	(0.93)	(0.50)	(0.07)	(0.79)	(0.71)	(0.67)	(0.17)	(0.57)	(0.59)	(0.46)	(0.82)	(0.78)	(0.95)	(0.48)	(0.82)	(0.21)	(0.99)	(0.79)	(0.32)	(0.11)	(0.67)	(0.98)
$\sum_{n=0}^{5}\delta_n$	-0.01		-0.09					-0.43				0.07	-0.53		0.26	0.14		0.23		-0.02		
Adj. R^2	0.35	0.26	0.32	0.20	0.46	0.03	0.41	-0.07	-0.02	0.45	0.25	0.33	0.58	-0.21	0.63	0.03	0.14	0.22	0.00	0.26	0.06	-0.14
$\hat{\sigma}$	0.05	0.01	0.02	0.02	0.02	0.03	0.02	0.04	0.03	0.03	0.04	0.02	0.02	0.03	0.02	0.03	0.04	0.02	0.05	0.04	0.02	0.03
JB	0.95	2.47	0.46	0.42	0.45	1.05	0.95	4.20	3.37	1.66	6.07	0.80	1.04	17.21	0.78	6.73	1.73	1.04	1.13	0.55	0.76	2.89
	(0.62)	(0.29)	(0.80)	(0.81)	(0.80)	(0.59)	(0.62)	(0.12)	(0.19)	(0.44)	(0.05)	(0.67)	(0.60)	(0.00)	(0.68)	(0.03)	(0.42)	(0.59)	(0.57)	(0.76)	(0.69)	(0.24)
LM(2)	0.96	0.50	0.43	1.01	1.09	3.00	0.50	0.21	0.59	18.32	2.26	0.53	3.76	0.18	0.52	0.96	0.44	0.35	1.45	0.41	0.95	1.59
	(0.43)	(0.63)	(0.67)	(0.42)	(0.39)	(0.12)	(0.63)	(0.81)	(0.58)	(0.00)	(0.19)	(0.61)	(0.09)	(0.84)	(0.62)	(0.43)	(0.66)	(0.72)	(0.31)	(0.68)	(0.44)	(0.28)
BPG	0.38	0.66	0.59	2.36	0.93	0.48	1.80	0.70	1.10	0.74	0.20	1.91	0.71	0.24	2.97	0.70	1.80	1.64	1.04	2.01	2.79	1.09
	(0.89)	(0.70)	(0.75)	(0.13)	(0.53)	(0.83)	(0.21)	(0.68)	(0.44)	(0.65)	(0.98)	(0.19)	(0.67)	(0.96)	(0.08)	(0.67)	(0.21)	(0.25)	(0.47)	(0.18)	(0.08)	(0.45)

Adj. R^2 – adjusted coefficient of determination; $\hat{\sigma}$ – standard error of regression; JB – Jarque-Bera normality test; LM(2) – Breusch-Godfrey Lagrange Multiplier test for autocorrelation up to order 2; BPG – Breusch-Pagan-Godfrey test for heteroskedasticity.

Summarized empirical results of short and long term effect of financial system's development on economic development are presented in Table VI.

TABLE VI
SHORT AND LONG TERM EFFECT OF FINANCIAL SYSTEM'S DEVELOPMENT ON ECONOMIC DEVELOPMENT

Country	Effect of banking sector development on economic development		Effect of stock market development on economic development		Effect of private bond market development on economic development	
	Short term	Long term	Short term	Long term	Short term	Long term
ARG			-	-	-	-
AUS		-	+	+		
BRA	+	+		+	-	-
CHE	-	+				
CHN	-	-		-		
COL				+		
ESP			+	+		
FIN	-	-	+	+	-	-
GBR				-		
GRC						
HKG	-	-				
IND			+	+	+	+
ITA					-	-
JPN	-	-				
KOR				+	-	+
MEX						+
MYS	-	-	+	+		
PRT				+		+
SGP	-	-	+	+		
THA				+		-
USA						
ZAF		-				

a sign "+" indicates about positive effect while a sign "-" – about negative effect.

Based on these empirical results and results presented by reference [19], the following conclusions can be formulated: (1) a positive short and long term effect of financial markets development on economic development was observed in countries those have market-based financial system (Australia, Columbia, India, Malaysia, and Singapore); (2) an effect of financial system's development on economic development in other countries is mixed: some components of financial system foster economic development while the impact of others is negative.

V. CONCLUSION

Summarizing the research results on short-run and long-run effect of financial system's development on economic development, the following conclusions can be made:

1. In most of countries a negative short and long term effect of banking sector development on economic development was observed. On the contrary, in most of cases a positive effect of stock market development on economic development of country was observed. However, the effect of private bond market development on economic development is mixed: in some countries the effect is positive while in others – negative.
2. A positive short and long term effect of financial markets development on economic development was observed only in countries those have market-based financial system.

The investigation of simultaneous impact of different components of the financial system (financial markets and banks) on economic development is suggested in future researches. The incorporation of different indicators characterizing the development level of financial system is also recommended in future empirical studies.

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